

MEDICAL SIMULATION WITH SIMULATED PATIENTS IN THE EDUCATION OF POLISH NURSING STUDENTS – PILOT STUDY

SYMULACJA MEDYCZNA Z UDZIAŁEM SYMULOWANYCH PACJENTÓW W KSZTAŁCENIU POLSKICH STUDENTÓW PIELEŃNIARSTWA – BADANIE PILOTAŻOWE

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ABSTRACT

Introduction. Nursing students in the first year of studies, before the start of clinical classes, have limited opportunities for communicating with patients. The use of standardised patients in the role of patients in various clinical scenarios allows for creating realistic situations and improving the students' patient communication skills.

Aim. The aim of the study was to evaluate the classes with the participation of simulated patients, the effects of communication with the patient during peripheral vein cannulation and the administration of medication via intravenous drip infusion.

Material and methods. The study was conducted in April 2019 among first-year students of the nursing course at the Faculty of Health Sciences at the Jagiellonian University Medical College. The research used original questionnaires for the teacher, the simulated patient and the student, as well as the Generalised Self-Efficacy Scale (GSES) and checklists for the procedures performed.

Results. Nursing students were very satisfied with the opportunity to participate in classes with simulated patients. They confirmed that receiving instant feedback strengthened their communication skills. Students demonstrating a greater sense of own effectiveness achieved higher scores in the assessment of their ability to communicate with a simulated patient.

Conclusions. It is necessary to develop students' sense of own effectiveness and enable them to improve their communication skills in various clinical situations.

KEYWORDS: standardised/simulated patient, student, nursing, communication.

STRESZCZENIE

Wprowadzenie. Studenci pielęgniarstwa na pierwszym roku studiów, przed rozpoczęciem zajęć klinicznych, mają ograniczone możliwości komunikowania się z pacjentami. Zastosowanie standaryzowanych pacjentów w roli pacjentów w różnych scenariuszach klinicznych pozwala tworzyć realistyczne sytuacje i doskonalić umiejętności studentów w zakresie komunikacji z pacjentem.

Cel. Celem pracy była ocena zajęć z udziałem symulowanych pacjentów, efektów komunikacji z pacjentem podczas kaniulacji żył obwodowych i podawania leków przez dożylny wlew kroplowy.

Materiał i metody. Badanie przeprowadzono w kwietniu 2019 r. wśród studentów pierwszego roku kierunku pielęgniarstwo na Wydziale Nauk o Zdrowiu Collegium Medicum Uniwersytetu Jagiellońskiego. W badaniach wykorzystano oryginalne kwestionariusze dla nauczyciela, symulowanego pacjenta i ucznia, a także Uogólnioną Skalę Poczucia Własnej Skuteczności (GSES) oraz listy kontrolne wykonanych procedur.

Wyniki. Studenci pielęgniarstwa byli bardzo zadowoleni z możliwości uczestniczenia w zajęciach z symulowanymi pacjentami. Potwierdzili, że natychmiastowe informacje zwrotne wzmocniły ich umiejętności komunikacyjne. Studenci wykazujący wyższe poczucie własnej skuteczności osiągnęli wyższe wyniki w ocenie ich umiejętności komunikowania się z symulowanym pacjentem.

Wnioski. Konieczne jest wzmacnianie poczucia własnej skuteczności studentów i umożliwienie im poprawy umiejętności komunikacyjnych w różnych sytuacjach klinicznych.

SŁOWA KLUCZOWE: pacjent standaryzowany/symulowany, student, pielęgniarstwo, komunikacja.

Introduction

Communication with the patient is one of the most important components of care in the nursing profession.

Effective communication determines the recognition of health problems and the process of diagnosis, care and treatment. It helps to ensure high quality care, satisfac-

tion and, above all, patient safety [1–2]. Communication failures are considered to be one of the main causes of medical errors [3].

In educating nursing students, great attention is paid to developing competences not only in the field of nursing knowledge and skills, but also social competencies also known as non-technical skills, which allow to apply theoretical knowledge in practice in a diverse inter-disciplinary and multicultural environment [4–5]. Social competencies include skills necessary to function in a specific group. They include not only the ability to communicate with patients, their families, medical staff, but also the ability to manage the work of others, being a member or a team leader, and the ability to improve oneself. Due to their nature, social competencies require a wide range of interaction at the learning stage, and medical simulation seems to be a very good way to teach them [6]. The main purpose of practical education is to acquire nursing, professional and social skills by students [4–5, 7].

A significant role in shaping competencies is played by the learning environment, which should create the opportunity to raise the level of competence, depending on the stage of education at which a person is.

Nursing students in the first year of full-time first-cycle studies have limited opportunities to communicate with the patient before commencing practical classes in clinical settings. Practical classes in the nursing skills laboratory allow mainly to acquire instrumental skills in the scope of performing nursing procedures and activities, i.e. technical skills, under the conditions of low fidelity simulation and to a lesser extent non-technical skills, i.e. communicating with the patient - analysing the students' behaviour towards the patient, emotions accompanying the contact, discussing mistakes, drawing conclusions.

In Poland, teaching medical students with the participation of Simulated Patients (SP) has been introduced recently, especially in teaching nursing students. It should be remembered, however, that teaching nursing skills in the laboratory has always been based on the low and medium fidelity simulation. The simulated patient was a teacher or a student also known as the Insider [6]. Due to changes in the curricula and examinations, it seems that in the near future teaching with the participation of SP as part of high fidelity simulations in Simulation Centres (single-profile, multi-profile) will become more and more common.

In the world, in the 1960s, a neurologist Howard Barrows (1993) was convinced of the effectiveness of teaching medical students with the participation of people simulating patients [8]. A simulated patient is a healthy person who can realistically and precisely

reproduce the history of the disease, imitating the real patient physically and emotionally. What is more, SPs enable immediate feedback after procedure. The use of SPs as patients in various clinical scenarios enables to create real situations and improve students' ability to communicate with the patient. This method shapes the student's right attitude. It allows to practice selected skills repeatedly in a safe environment before the student meets a real patient. In other words, simulation is an educational strategy used to replicate real experiences [9]. Simulations provide an innovative approach to strengthen important communication skills and give students a range of effective techniques to apply. Numerous studies have shown that this way of teaching medical students brings positive effects [10–12].

Studies have confirmed that the use of SPs for classes enables immediate feedback from the patient, which facilitates students improving their communication skills [13–15]. Simulated Patients provide very valuable feedback to both learners and educators/teachers that provide opportunities to improve the curriculum. Education with the participation of SPs also allows to develop the skills of correct clinical judgement as well as clinical reasoning [16]. SPs require pedagogical and acting preparation and well-written scripts [6].

Also in teaching nursing there was an increase in the frequency of using SPs [17–19]. It has been found that the use of SPs to teach the skills of assessing the patient's health by nursing students facilitates interaction with the patient, thus indirectly influencing subsequent care of the patient. It has also been shown that classes with the participation of SPs increase the level of students' knowledge [12].

Developing nursing determines the need to test oneself in new conditions and meet new requirements and challenges of modern education. Human action is determined by many complex variables. The often indicated factor determining many aspects of human behaviour is the sense of self-efficacy. Self-efficacy is important in the process of achieving goals. A strong sense of self-efficacy in a particular situation allows you to set higher goals for your own actions, take actions even in the face of failure [19].

Student self-efficacy related to clinical skills is important to successful performance in the academic setting [20]. Self-efficacy is an important outcome of nursing education [21–22].

Aim

The objective of the study was to assess the non-technical skills of nursing students during classes with the participation of Simulated Patients implemented in the nursing skills laboratory within the subject of nursing basics. The following specific aims were set:

- What was the intensity of self-efficacy of the surveyed nursing students?
- At what level did the SPs and nursing teachers assess non-technical skills of the surveyed nursing students?
- How does the sense of self-efficacy determine the non-technical skills of the surveyed nursing students?
- How do the nursing students assess the usefulness of classes with the participation of SPs in the perspective of further education?

Material and methods

The tests were carried out by the diagnostic poll method, survey and scaling techniques. The research tools used were: the author's own questionnaire, the scale for assessing soft skills (the same version for SPs and the nursing teacher) and the standardized scale – *Generalized Self-Efficacy Scale (GSES)* by Schwarzer, Jerusalem, Juczyński. The student's instrumental skills were assessed according to the *checklist* for the procedure (in this study this part was not included in the analysis).

The study was conducted in the second term of the 2018/2019 academic year among 69 first-year nursing students of the first-cycle full-time studies at the Faculty of Health Sciences of the Jagiellonian University Collegium Medicum. The study group was dominated by women $N = 67$ (97.1%). The average age of the respondents was 20.89 years ($SD = 2.47$).

The research was carried out during the nursing skills laboratory classes with the participation of SPs. Before starting the task, students were instructed that they would be assessed by the nursing teacher and SPs (in terms of communicating with the patient and the correctness of the procedure), and after completing the task they would receive *feedback* and would be asked to complete a survey regarding assessment of classes with the participation of SPs and the GSES scale. Students were informed about the confidentiality and anonymity of the study and about the fact that participation in it is voluntary and that they can refuse participation at any time.

As part of the classes with SPs, the main topic was peripheral venous cannulation. The student's task, in addition to the procedure itself, was to prepare the patient mentally and physically (SP) for the procedure, to keep him/her informed about the activities performed and to take care of him/her immediately after the procedure. During the procedure, the student's non-technical skills were assessed in the following areas:

- providing information about the nature and purpose of the procedure (information about the procedure),

- obtaining information about the patient's previous experiences related to the procedure (verification of prerequisites),
- empathic reaction and response to the current needs of the patient (cooperation with the patient),
- commitment and readiness to cooperate with the patient at every stage of the procedure (answering questions).

Individual ranges were assessed using a 4-point scale: insufficient, satisfactory, good, very good. The student could get from 4 to 16 points in each of two grades – from the SP and the nursing teacher.

The survey questionnaire regarding classes with SPs participation included questions related to: verbal and non-verbal communication with SPs, pros and cons of classes with SPs participation, usefulness of classes with SPs participation in the perspective of further education. Students evaluated verbal and non-verbal communication with the patient using a 4-point scale, where 1 – insufficient, 2 – satisfactory, 3 – good, 4 – very good. Questions regarding advantages and disadvantages as well as usefulness of classes with SPs participation in the perspective of further education were open questions.

The Generalized Self-Efficacy Scale (GSES) measures the strength of an individual's overall belief in the effectiveness of dealing with difficult situations and obstacles. It consisted of 10 statements referring to various personal traits, which the respondent assessed as true or false in his case, using the following scoring: 1 – no, 2 – rather not, 3 – rather yes, 4 – yes. The theoretical range of the scale was from 0 to 40 points. The maximum number of points that could be obtained was a range of 30–40 points, which indicated a high sense of self-efficacy. Range 25–29 points meant the average level, and the range of 10–24 points meant the low level [23].

Nursing students were distributed 156 questionnaires, 107 were received, and after verifying the correctness of completing, 69 questionnaires were included in the analysis, which constituted 73.83% of the sample. The questionnaires received from the respondents were assessed and checked for completeness, the data was encoded, entered into the database and processed using the PSPP program and MS Office 2019 in the statistical environment R ver. 3.6.0. Relationships between the variables were verified by means of the Chi-Square test of independence. The Shapiro -Wilk test was used for checking normality of continuous variables. The correlations were analysed with the Spearman rank correlation coefficient.

The adopted level of significance was $\alpha = 0.05$.

Results

The examined group of nursing students in GSES obtained an average score of $M = 31.09$ ($SD = 2.98$). The lowest score was $Min = 23.00$, and the highest $Max = 37.00$. Half of the people obtained a score not less than $Me = 31.00$, while the other half obtained a score not greater than $Me = 31.00$. After transformation into standardized units, categories were created to classify the results as: low, medium and high.

The vast majority of the surveyed nursing students was characterized by a high sense of self-efficacy (73.9%). 23.2% of students had a belief in average self-efficacy, and only 2.9% of respondents had low self-efficacy.

For the purposes of the analysis, due to the small number of participants within *low* categories, it was merged with the *medium* category.

Table 1. Assessments obtained by the surveyed nursing students during the performance of the task with the participation of SPs

	category	N	M	SD	Min	Max	Me
Simulated Patient assessment	information about the procedure	69	3.09	0.78	1.00	4.00	3.00
	verification of prerequisites	69	2.81	0.99	1.00	4.00	3.00
	cooperation with the patient	69	3.25	1.02	1.00	4.00	4.00
	answers to questions	69	3.22	0.82	1.00	4.00	3.00
Teacher's assessment	information about the procedure	69	3.44	0.68	2.00	4.00	4.00
	verification of prerequisites	69	2.91	0.78	2.00	4.00	3.00
	cooperation with the patient	69	3.36	0.71	2.00	4.00	3.00
	answers to questions	69	3.44	0.63	2.00	4.00	4.00

N – number; M – average; SD – standard deviation; Min – minimum; Max – maximum; Me – median

Table 1 above shows the average and median scores of assessments obtained by students. In the case of assessment by the patient, the highest scores were issued in the area of cooperation with the patient. Half of the students obtained in this area not less than $Me = 4.00$ (i.e. very good), while in the remaining areas half of the students received not more than $Me = 3.00$ (or good). In the case of the teacher's assessment, the highest scores were given in the area of information about the procedure and answers to questions. Half of the students obtained in these areas not less than $Me = 4.00$

(i.e. very good), while in the remaining areas half of the students received not more than $Me = 3.00$ (or good).

Table 2. Self-efficacy of the nursing students surveyed and the assessments issued by the SP

Patient information		Self-efficacy of the student		Result of the test
		medium or low	high	
information about the procedure	lower than good	N 6	8	$\chi^2 = 2.578$ df = 2 p = 0.276
		% 33.3%	15.7%	
	good	N 7	26	
		% 38.9%	51.0%	
	very good	N 5	17	
		% 27.8%	33.3%	
verification of prerequisites	lower than good	N 5	20	$\chi^2 = 0.757$ df = 2 p = 0.685
		% 27.8%	39.2%	
	good	N 7	17	
		% 38.9%	33.3%	
	very good	N 6	14	
		% 33.3%	27.5%	
cooperation with the patient	lower than good	N 4	11	$\chi^2 = 0.594$ df = 2 p = 0.743
		% 22.2%	21.6%	
	good	N 5	10	
		% 27.8%	19.6%	
	very good	N 9	30	
		% 50.0%	58.8%	
answers to questions	lower than good	N 5	8	$\chi^2 = 1.672$ df = 2 p = 0.434
		% 27.8%	15.7%	
	good	N 5	21	
		% 27.8%	41.2%	
	very good	N 8	22	
		% 44.4%	43.1%	

χ^2 – test statistics; df – degrees of freedom; p – statistical significance

Students with medium or low self-efficacy similarly as respondents with high self-efficacy received a good score from the patient. There was no significant relationship ($p > 0.05$) between self-efficacy and the assessment of information about the procedure, the verification of prerequisites in the study group.

Nursing students with medium or low self-efficacy most often, like respondents with high self-efficacy, received a very good score from the patient. There was no significant relationship ($p > 0.05$) between self-efficacy and the assessment of cooperation with the patient and the assessment of answers to questions.

To sum up, in none of the areas or categories/criteria mentioned there were significant relationships ($p > 0.05$) between self-efficacy of the nursing students and the patient's assessment.

Table 3. Self-efficacy of the nursing students surveyed and the assessments issued by the teacher

Teacher's assessment		self-efficacy		Result of the test
		medium or low	high	
information about the procedure	satisfactory	N	4	3
		%	22.2%	5.9%
	good	N	7	18
		%	38.9%	35.3%
	very good	N	7	30
		%	38.9%	58.8%
verification of prerequisites	satisfactory	N	8	16
		%	44.4%	31.4%
	good	N	8	19
		%	44.4%	37.3%
	very good	N	2	16
		%	11.1%	31.4%
cooperation with the patient	satisfactory	N	5	4
		%	27.8%	7.8%
	good	N	8	18
		%	44.4%	35.3%
	very good	N	5	29
		%	27.8%	56.9%
answers to questions	satisfactory	N	2	3
		%	11.1%	5.9%
	good	N	8	21
		%	44.4%	41.2%
	very good	N	8	27
		%	44.4%	52.9%

χ^2 – test statistics; df – degrees of freedom; p – statistical significance

Students with medium or low self-efficacy in terms of information about the procedures most often received a good and a very good score from the teacher. Respondents with high self-efficacy most often also received a very good score from the teacher in the assessment of information about the procedure.

Students with medium or low self-efficacy most often received a satisfactory and a good score from the teacher while respondents with high self-efficacy most often received a good score from the teacher in the assessment of the verification of prerequisites. There was no significant relationship ($p > 0.05$) between self-efficacy and the assessment of information about the procedure in the study group (**Table 3**) and between self-efficacy and the assessment of the verification of prerequisites in the study group (**Table 6**).

Nursing students with medium or low self-efficacy most often received a good score from the teacher while students with high self-efficacy most often received a very good score from the teacher. In other words, respondents with a high self-efficacy received significantly higher scores from the teacher than others. There is

a significant relationship between self-efficacy and the assessment of cooperation with the patient in the study group.

Students with medium or low self-efficacy most often received a good and a very good score from the teacher while respondents with high self-efficacy most often received a very good score. There was no significant relationship ($p > 0.05$) between self-efficacy and the assessment of answers to questions in the study group.

Table 4. Self-efficacy of the nursing students surveyed and the belief in developing communication skills and knowledge

		self-efficacy		Result of the test	
		medium or low	high		
belief in develop- ing communi- cation skills and knowledge	yes	N	12	44	$\chi^2 = 2.186$ df = 1 p = 0.139
		%	66.7%	86.3%	
	rather yes	N	6	7	
		%	33.3%	13.7%	
Total		N	18	51	
		%	100.0%	100.0%	

χ^2 – test statistics; df – degrees of freedom; p – statistical significance

Students with medium or low self-efficacy most often were definitely convinced of developing communication skills and knowledge as well as students with high self-efficacy most often (86.3%) were also strongly convinced of this. There were no statistically significant differences ($p > 0.05$). It should also be noted that there were only *yes* and *rather yes* answers, there were no negative answers (*rather no* and *no*), which shows that all students were more or less convinced of developing communication skills and knowledge (**Table 4**).

Table 5. Self-efficacy of the nursing students surveyed and the belief that they perfected simulation tasks

		self-efficacy		Result of the test
		medium or low	high	
belief in perfecting simulation activities	yes	N	4	19
		%	22.2%	37.3%
	rather yes	N	14	32
		%	77.8%	62.7%
Total		N	18	51
		%	100.0%	100.0%

χ^2 – test statistics; df – degrees of freedom; p – statistical significance

Students with medium or low self-efficacy most often were rather convinced of perfecting simulation activities

similarly as students with high self-efficacy. There were no statistically significant differences ($p > 0.05$). It should also be noted that there were only *yes* and *rather yes* answers, there were no negative answers (*rather no* and *no*), which shows that all students were more or less convinced of perfecting simulation activities (Table 5).

Table 6. The sense of self-efficacy of the nursing students surveyed and the assessment of information provided by the SP and the behaviour of the SP in the students' opinion

		self-efficacy		Result of the test
		medium or low	high	
assessment of information provided by the SP	satisfactory	N	12	$\chi^2 = 3.003$ df = 1 p = 0.083
	or good	%	66.7%	
	very good	N	6	
		%	33.3%	
SP's behaviour assessment	satisfactory	N	10	$\chi^2 = 0.041$ df = 1 p = 0.839
	or good	%	55.6%	
	very good	N	8	
		%	44.4%	

χ^2 – test statistics; df – degrees of freedom; p – statistical significance

Students with a medium or low self-efficacy most often rated the information provided by the patient satisfactory or well, while students with a high sense of self-efficacy most often rated it very well. In other words, students with a high sense of self-efficacy rated patients' information higher than other students (Table 6).

Students with medium or low self-efficacy most often rated the patient's behaviour very well, as did students with high self-efficacy. There was no significant relationship ($p > 0.05$) between self-efficacy and the assessment of the patient's behaviour or the assessment of information provided by the SP in the study group.

Table 7. The sense of self-efficacy of the nursing students surveyed and the teacher's assessment of cooperation with the SP and assessment of information provided by the SP

		Teacher's assessment: cooperation with the patient (ONWP)	Assessment of information provided by the SP (ISP)
General indicator of self-efficacy (OWPS)	rho	0.156	0.036
	p	0.200	0.768

rho – Spearman's correlation coefficient; p – significance, *p < 0.05; **p < 0.01; *** p < 0.001

There was no statistically significant correlation ($p > 0.05$) between the general indicator of self-efficacy and the teacher's assessment in terms of: cooperation

with the patient and assessment of information provided by the SP (Table 7).

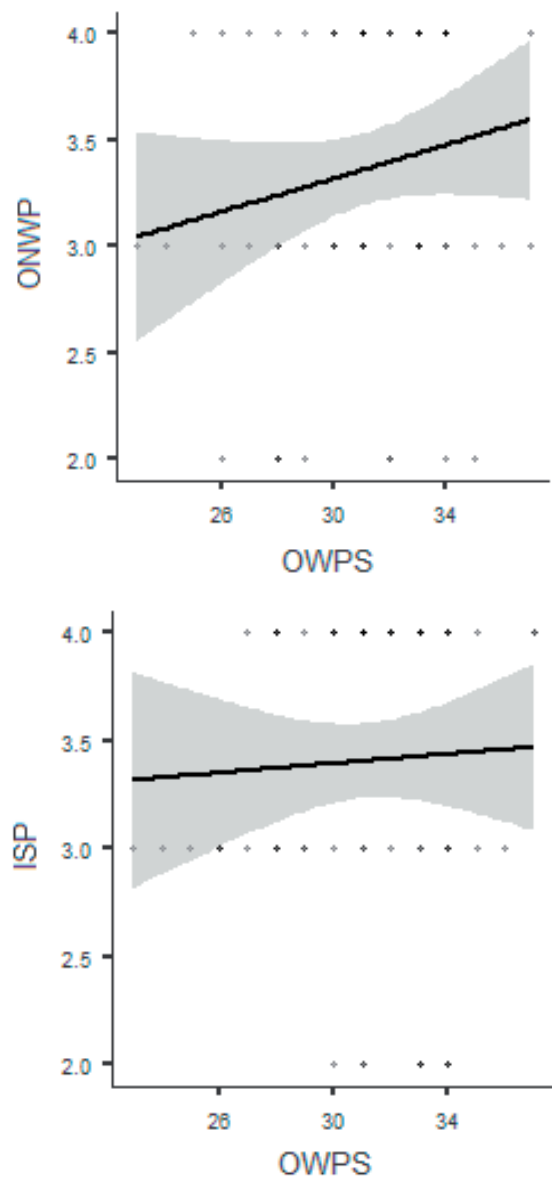


Figure 1. The sense of self-efficacy of the nursing students surveyed and the teacher's assessment of cooperation with the patient and assessment of information provided by the SP

All students were convinced of the need to continue classes with the participation of SPs.

Discussion

The sense of self-efficacy of nursing students in undertaking practical activities, as emphasized by Kennedy [24], is important for education and professional nursing practice. In their own research, most students showed a high sense of self-efficacy. Research results by Tada et al. [25] confirmed that classes with the participation of simulated patients strengthened students' self-efficacy.

cy in using interpersonal skills in dealing with patients and preparing for clinical classes. However, the results of research conducted by Bodys-Cupak et al. [26] allowed to state that nursing students with a higher sense of self-efficacy achieved a higher level of professional competence. Gore [22] and Andrea and Kotowski [27] agree that the strong sense of self – efficacy influences a student's ability to take on more challenging tasks, self-regulate better in the learning process and apply more cognitive strategies to their learning.

In the conducted own research there was a significant relationship between the sense of self-efficacy and the assessment of information provided by the SP in the opinion of the nursing students surveyed. In addition, there was also a significant relationship between the sense of self-efficacy of the nursing students surveyed and the assessment of cooperation with the Simulated Patient.

Research results by Tada et al. [25] confirmed that classes with the participation of Simulated Patients strengthen students' self-efficacy in using interpersonal skills in dealing with patients and prepare for clinical classes. However, the results of the research by Gute et al. [28] showed no positive correlations between self-efficacy assessment and expert assessments, which showed limitations in the use of self-assessment scales of communication skills used by researchers. As in the studies of Witt et al. [12], all nursing students participating in the presented research were very pleased with the opportunity to improve their communication skills and convinced of the need to continue classes with simulated patients in the future. In studies conducted by MacLean S. et al. [15], students were also convinced of having greater certainty/proficiency in the ability to communicate with the patient after classes with the SP.

Conclusions

- Soft communication non-technical skills of the surveyed nursing students during the implementation of the task with the participation of the Simulated Patient were assessed at a good and very good level by teachers and SPs.
- The sense of self-efficacy of the surveyed nursing students determined the quality of communication with the patient in terms of cooperation during the task.
- All surveyed nursing students highly rated the usefulness of classes with the participation of SPs and pointed to the need to increase the number of such classes.

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